

## CLAIMS

What is claimed is:

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1. A method to maintain a hierarchy of application objects, the method including:

3  
4 automatically detecting exit of a child application object;

5  
6 automatically terminating a grandchild application object  
7 launched by the child application object;

8  
9 attempting restart of the child application object; and

10  
11 signaling an outcome of the restart to a parent application  
12 object that launched the child application object.

1 2. The method of claim 1 including maintaining an application  
2 hierarchy recording a hierarchical relationship between the parent, child and  
3 grandchild application objects.

1 3. The method of claim 2 wherein the maintaining of the  
2 application hierarchy includes launching the parent application object,  
3 launching the child application object responsive to a request from the

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4 parent application object, and launching the grandchild application object  
5 responsive to a request from the child application object.

1 4. The method of claim 1 wherein, if the restart of the child  
2 application object is successful, then communicating a restart message to the  
3 parent application object to inform the parent application object of the  
4 successful restart.

1 5. The method of claim 1 wherein, if the restart of the child  
2 application object is not successful, then communicating a failure message to  
3 the parent application object to inform the parent application object of the  
4 failed restart.

1 6. The method of claim 1 wherein the automatic detecting of the  
2 exit of the child application object includes detecting hanging of a process of  
3 the child application object.

1 7. The method of claim 1 including automatically determining  
2 whether the exit of the child application object was expected, and only  
3 attempting the restart if the exit was unexpected. *Prin*

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1           8.     The method of claim 1 wherein, if the restart of the child  
2 application object is successful, then creating a new process identifier for the  
3 process of the child application object.

1           9.     A system to maintain a hierarchy of application objects, the  
2 system including:

3  
4                 a watchdog automatically to detect exit of a child application  
5 object; and

6  
7                 an executor automatically to terminate a grandchild  
8 application object launched by the child application object, to  
9 attempt restart of the child application object, and to signal an  
10 outcome of the restart to a parent application object that  
11 launched the child application object.

1           10.    The system of claim 9 wherein the executor is to maintain an  
2 application hierarchy recording a hierarchical relationship between the  
3 parent, child and grandchild application objects.

1           11.    The system of claim 10 wherein the executor is to launch the  
2 parent application object, to launch the child application object responsive to

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3 a request from the parent application object, and to launch the grandchild  
4 application object responsive to a request from the child application object.

1 12. The system of claim 9 wherein, if the restart of the child  
2 application object is successful, the executor is to communicate a restart  
3 message to the parent application object.

1 13. The system of claim 9 wherein, if the restart of the child  
2 application is not successful, the executor is to communicate a failure  
3 message to the parent application object.

1 14. The system of claim 9 wherein the watchdog is to  
2 automatically detect the exit of the child application object by detecting a  
3 hang state for a process of the child application object.

1 15. The system of claim 9 wherein the executor is to determine  
2 whether the exit of the child application object was expected and only to  
3 attempt the restart if the exit was unexpected.

1 16. The system of claim 9 wherein the executor, if the restart of the  
2 child application is successful, is to create a new process identifier for a  
3 process of the child application object.

1           17.    A machine-readable medium storing a sequence of instructions  
2   that, when executed by a machine, cause the machine to:

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3                                   automatically detect exit of a child application object;  
4

5                                   automatically terminate a grandchild application object  
6   launched by the child application object;  
7

8                                   attempt restart of the child application object; and  
9

10                                  signal an outcome of the restart to a parent application object  
11   that launched the child application object.  
12

1           18.    A system to maintain a hierarchy of application objects, the  
2   system including:

3                                   first means for automatically detecting exit of a child  
4   application object and;  
5

6                                   second means for automatically terminating a grandchild  
7   application object launched by the child application object, for  
8   attempting restart of the child application object, and for  
9

signaling an outcome of the restart of the parent application

object that launched the child application object.